REMARKS

Claims 1-22 remain pending in the application, with claims 1, 13 and 17-19 being the independent claims. Reconsideration and further examination are respectfully requested.

Claim 1 has been amended above to move limitations from the preamble of the claim to its body. No change in substance was intended. Claim 18 has been amended above to more closely conform to independent claim 1.

The present invention concerns the computation of cell delays by generating and utilizing a delay equation that characterizes delays in terms of certain parameters of the cell that include process, supply voltage, temperature, input ramptime and output load.

Thus, independent claims 1, 17 and 18 are directed to a method, apparatus and system, respectively, in which a first set of cell delays is generated by assigning nominal values to cell parameters and a second set of cell delays is generated by varying values assigned to the cell parameters. A delay equation is then created based on the first and second sets of delays, and cell delays are computed using the delay equation, with the delay equation characterizing the delays in terms of the cell parameters. Those parameters include process, supply voltage, temperature, input ramptime and output load.

Similarly, independent claims 13 and 19 are directed to a method and an apparatus, respectively, for computing cell delay in which a first set of cell delays is generated in a first simulation by using nominal values for process, supply voltage and temperature of the cell. A time value is assigned within a first range to an input ramptime of the cell during the generation of each of the delays in the first set, a load

value is assigned within a second range to an output load of the cell during the generation of each of the delays in the first set, and a second set of the cell delays is generated in a second simulation by using non-nominal values for the process, supply voltage and temperature of the cell. A delay equation is created based on the first and second sets of delays, and cell delays are computed using the delay equation, with the delay equation characterizing the delays in terms of the process, supply voltage, temperature, input ramptime and output load of the cell.

The creation and use of a delay equation in the foregoing manner is not disclosed or suggested by the applied art. This distinction is discussed below with respect to each of the categories of rejection in the current Office Action.

In the Office Action, claims 1-22 were rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-15 of U.S. Patent 6,484,297 (Dixit). Withdrawal of this rejection is respectfully requested for the following reasons. Each of the currently pending claims recites the features of creating a delay equation based on first and second sets of delays and then using the delay equation to compute delays, with the delay equation characterizing delays in terms of process, supply voltage, temperature, input ramptime and output load of the cell. Nothing in claims 1-15 of the Dixit Patent appears to suggest the generation or use of such an equation. Accordingly, withdrawal of the double patenting rejection is respectfully requested.

In the Office Action, claims 1-22 were rejected under 35 U.S.C. § 103(a) over U.S. Patent 5,802,349 (Rigg). Withdrawal of this rejection is respectfully requested for the following reasons.

Rigg concerns the problem of generating an optimized integrated circuit cell library for a particular application. See, e.g., Rigg's Title, Abstract and Col. 2, Line 62-64. As described from Column 2, Line 62 to Column 3, Line 57 of Rigg, Rigg's technique involves establishing a set of cell parameters, simulating the operation of the cell given those parameters, determining how effective the cell is at meeting desired performance criteria and then modifying the cell parameters in an iterative manner so as to improve the performance of the subject cell for the particular application. It is noted that all of the cell parameters to which Rigg is referring are related to the construction of the cell. See, e.g., Col. 3, Lines 5-9. This is consistent with Rigg's purpose, which is to provide an optimal design for each cell, given the particular application in which the cell will be used.

While the present claims also reference cell parameters, most of the recited parameters that are specifically identified in the claims (i.e., voltage, temperature, input ramptime and output load) concern operating conditions in which the cell is to be found. As recited in each of the present claims, the delay equation that is generated and used according to the present invention characterizes cell delay in terms of such operating condition parameters.

In contrast, nothing in Rigg is seen to suggest generating or utilizing any such equation. Rather, because Rigg is primarily concerned with generating an optimized cell library, its disclosure only mentions simulating cells for different combinations of cell construction parameters.

For example, where Rigg refers to delay and output rise/fall edge rate ratios, those references are in connection with the cost function for evaluating the quality of a

particular cell design (i.e., a given set of cell construction parameters). Once again, Rigg does not appear to generate any delay equation using the types of cell parameters recited in the present claims.

For these reasons, independent claims 1, 13 and 17-19 are believed to be allowable over the applied art. The other claims in the application depend from these independent claims and are believed to be allowable for at least the same reasons. In addition, each such dependent claim recites an additional feature of the invention that further distinguishes the invention from the applied art. Accordingly, the individual reconsideration of each on its own merits is respectfully requested.

In view of the foregoing remarks, the entire application is believed to be in condition for allowance, and an indication to that effect is respectfully requested.

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Respectfully submitted,

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